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No. XVII.

**SELF-ACTING FEEDER FOR HIGH-PRESSURE
STEAM-BOILERS.**

The LARGE SILVER MEDAL and FIFTEEN GUINEAS were this session presented to Mr. R. W. FRANKLIN of Tottenham Court-road, for his SELF-ACTING APPARATUS FOR FEEDING HIGH-PRESSURE STEAM-BOILERS. The following communication has been received from Mr. Franklin on the subject.

SIR,

92, Tottenham-court-road,
March 8, 1824.

I REQUEST that you will submit to the inspection of the Society of Arts a method invented by me for feeding the boilers of high-pressure steam-engines by means of a float. It is the universal practice to feed the boilers of condensing engines by this method; but to its application in the usual way to high-pressure boilers there are two objections. The first is the inconvenient height of the jack-head, in order to counterbalance the pressure of the steam, (a pressure of forty pounds on the inch requiring the jack-head to be seventy feet higher than the boiler): the second, is the difficulty of packing the float-rod, so as to prevent the escape of steam and yet allow the rod to move easily when acted on by so small a force as the hydrostatic weight of the float.

My improvement consists in the substitution of a heavily-loaded valve instead of a high jack-head, and in avoiding altogether the use of a stuffing box, by placing the lever of the float within the boiler, as will be evident on referring to the representation in plate XV.

a Is the top of the boiler, *b* the man-hole, *c* the level of the water in the boiler, *d* a lever suspended by an arm to the top of the boiler, and having the float *e* at one end and the counterpoise *f* at the other. *g* Is a rod of half-inch round iron, connected with that arm of the lever which carries the counterpoise: it passes through the guide or ring *i*, which is rivetted to the feed-pipe *k*, and expands at bottom into a round flat disk *h*.

The feed-pipe *k* is long enough to have its lower orifice always below the level of the water *c*; its upper end is closed by the valve *l*, and to the bottom of the valve is screwed a long tail or spindle, which, when the valve is shut, descends below the opening of the feed-pipe, and almost rests upon the plate or disk *h*. As the water lowers by evaporation, the float end of the lever descends and the opposite end rises; the consequence of this will be to raise the rod *g*, to bring the plate *h* in contact with the end of the spindle of the valve *l*, and thus to raise the valve itself above the opening of the feed-pipe, as represented in the plate. The box *m* having been previously filled with water by means of the forcing-pump at the end of the service-pipe *n n* (not represented in the plate), all reflux of hot water from the boiler is prevented by the valve *o*. As soon as the pressure of the forcing-pump exceeds that of the steam, the valve *o* is lifted and water passes through the pipe *n* into the box *m*, and thence down the

feed-pipe *k* into the boiler, the valve *l* being prevented from closing by the support which it receives from the plate *h*. As the level of the water in the boiler rises, the counterpoise end of the lever *d* descends, and with it the rod *g*, the plate *h*, and the valve *l*. In this position of the machinery the water delivered by the service-pipe raises the valve *p*, passes into the box *q*, and flows off by the waste water-pipe *s*. The valve *p* also acts as a safety-valve to the boiler, its pressure being adjusted by means of the weight on the lever *r*.

The working pressure of the steam in the boiler having been determined, the load on the valve *p* must be greater than this, but less than the power applied to the forcing-pump.

I am, Sir,

&c. &c. &c.

A. Aikin, Esq.

Secretary, &c. &c.

R. W. FRANKLIN.